

IS TRAIT BOREDOM ABOUT WHAT YOU FEEL OR HOW YOU WANT TO RESPOND
TO BORING SITUATIONS?

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Abstract

If state boredom signals that one's cognitive resources are not engaged in a situation and pushes an individual to seek cognitive engagement, then this study tested the idea that trait boredom moderates the impact of a boring situation on individuals' response motivations, as opposed to individuals' experience of state boredom. Participants were randomly assigned to watch a boring or a non-boring video clip after completing the Short Boredom Proneness Scale (SBPS). All participants rated their state boredom experience and response motivations before and after watching their assigned video. The situation and SBPS independently predicted state boredom experience, however only the SBPS predicted certain response motivations (uncertainty of what to do, difficulties with amotivation/avolition, and lack of motivation to seek meaning or creativity). The SBPS also interacted with the situation in predicting participants' motivation to seek relief and to be destructive. The implications of the findings and future directions are discussed.

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Introduction

Boredom is a universal feeling. Both healthy and patient populations (Binnema, 2004; Eastwood, Cavaliere, Fahlman, & Eastwood, 2007; Hamilton, Haier, & Buchsbaum, 1984; Seel & Kreutzer, 2003; Vodanovich, 2003), as well as individuals of all cultures, genders, and ages (Gana & Akremi, 1998; Musharbash, 2007; Ng, Liu, Chen, & Eastwood, 2015; Sundberg, Latkin, Farmer, & Saoud, 1991; Vodanovich, Watt, & Piotrowski, 1997; Weinstein, Xie, & Cleanthous, 1995) experience boredom. Regardless of whether a person is at work or at home (Chin, Markey, Bhargava, Kassam, & Loewenstein, 2017; Fisher, 1993; Game, 2007; Grubb, 1975; Iso-Ahola & Weissinger, 1987; van Hooff & van Hooft, 2014), is a student in a classroom, an inmate in prison, or a driver behind the wheel, is studying, working, or simply doing nothing (Acee et al., 2010; Belton & Priyadharshini, 2007; Chin et al., 2017; Grassian, 2006; Larson & Richards, 1991; Mann & Robinson, 2009), boredom finds that individual. One study found that 51 percent of adolescents feel bored easily (GPC Research & Health Canada, 2003; as cited in Eastwood et al., 2007); another study reported that 91 percent of North American youth feel boredom (The National Center on Addiction and Substance Abuse, 2003; as cited in Eastwood, Frischen, Fenske, & Smilek, 2012); and a third study found that 63 percent of American adults will experience boredom at least once within a 10 day period (Chin et al., 2017). Boredom is such a common feeling that most individuals experience little trouble at both recognizing it and distinguishing it from other related subjective states (Goldberg, Eastwood, Laguardia, & Danckert, 2011; Van Tilburg & Igou, 2012).

Yet, the concept, definition, and measurement of *trait boredom* are underdeveloped (Hunter, Hunter, & Eastwood, 2016; Gana, Broc, & Bailly, 2019; Struk, Carriere, Cheyne, & Danckert, 2015; Vodanovich & Watt, 2016). What do measures of trait boredom really tap into?

What does it mean for an individual to obtain a high score on a trait boredom scale? The purpose of the current experimental study is to further clarify what an existing scale of trait boredom measures—specifically, to examine a novel conceptualization of trait boredom that is linked to a functional account of state (in-the-moment) boredom. That is, if *state boredom* functions as a self-regulatory signal that indicates that one’s cognitive resources are not engaged within a given situation (i.e., activity, task, etc.) and that pushes an individual to seek optimal use of his/her cognitive resources (Danckert, Mugon, Struk, & Eastwood, 2018; Elpidorou, 2014; Elpidorou, 2018a; Elpidorou, 2018b), then the current study tests the idea that the measurement of trait boredom is more representative of individuals’ *responses* in boring contexts, as opposed to the intensity (or, more broadly, the *experience*) of boredom in such contexts.

Types of Boredom and Measurement of Trait Boredom

Given the widespread nature of the feeling of boredom, its prevalence, and individuals’ familiarity with it, it is unsurprising that the study of boredom has moved from the fringes of psychological science toward the mainstream (Van Tilburg & Igou, 2017). In a bibliographic analysis of journal articles, Piotrowski (2013) examined the major topical issues emphasized in boredom research. The author examined the frequency in which the term “boredom” appeared in titles of articles, excluding citations to dissertations and book chapters. Out of a total of 22 topical areas in boredom research (e.g., leisure boredom, sexual boredom, cross cultural comparisons, etc.), the study of individual differences in boredom was the most commonly researched area in the last two decades, followed by the investigation of the measurement and assessment of boredom (Piotrowski, 2013).

Indeed, both of these topical areas are highly interconnected: Understanding individual differences in boredom is contingent upon the measurement/assessment of boredom, and the

measurement/assessment of boredom is contingent upon precisely what individual differences researchers seek to explore. Accordingly, the trait of boredom (*trait boredom* or *boredom propensity*; these terms are used interchangeably), for which psychologists have grown particularly interested (Hunter et al., 2016), ought to be distinguished from the state of boredom. The latter, *state boredom*, is widely understood to refer to the actual experience of boredom in a given moment—the aversive feeling associated with being cognitively unengaged¹, despite wanting to be engaged in satisfying activity (Eastwood et al., 2012; Fahlman, Mercer-Lynn, Flora, & Eastwood, 2013). However, despite the myriad relations between trait boredom and significant bodily, psychological, and social harms (e.g., depression, anxiety, anger and aggression, increased impulsivity and sensation seeking, lower job and life satisfaction, impoverished life meaning, problem gambling, drug and alcohol abuse, poor interpersonal and social relationships, a lower tendency to engage in and enjoy thinking, and a propensity to make errors when completing common tasks; Ahmed, 1990; Blaszczynski, McConaghy, & Frankova, 1990; Dahlen, Martin, Ragan, & Kuhlman, 2004; Fahlman, Mercer, Gaskovski, Eastwood, & Eastwood, 2009; Farmer & Sundberg, 1986; Goldberg et al., 2011; Gordon, Wilkinson, McGrown, & Jovanoska, 1997; Isacescu, Struk, & Danckert, 2016; Iso-Ahola & Crowley, 1991; Johnston & O'Malley, 1986; Kass, Vodanovich, & Callander, 2001; Lee, Neighbors, & Woods, 2007; LePera, 2011; Leong & Schneller, 1993; Mercer & Eastwood, 2010; Rupp & Vodanovich, 1997; Seib & Vodanovich, 1998; Sommers & Vodanovich, 2000; Vodanovich, Verner, & Gillbride, 1991; Watt & Blanchard, 1994; Wallace, Kass, & Stanny, 2002; Watt & Vodanovich,

¹ It should be clarified that being cognitively engaged is not the same as exerting mental effort, as an individual can possess no intention to engage with particular stimuli or events, with no concomitant exertion of mental effort, and yet still be cognitively engaged (e.g., unintentional mind-wandering, fantasizing, etc.; Seli, Risko, Smilek, & Schacter, 2016). Mental effort indicates what was required to become engaged, but boredom indicates that an individual's cognitive abilities are not engaged (for more information, see Danckert et al., 2018).

1992; Watt & Vodanovich, 1999), there is no consensus on what trait boredom means (Belton & Priyadharshini, 2007; Kanevsky & Keighley, 2003; Vodanovich & Watt, 2016), but rather an honest admission that it “remains a construct that is difficult to define” (Goldberg et al., 2011, p. 649; Malkovsky, Merrifield, Goldberg, & Danckert, 2012, p. 59).

With respect to the measurement/assessment of trait boredom, the Boredom Proneness Scale (BPS; Farmer & Sundberg, 1986) and the Boredom Susceptibility Scale (ZBS; Zuckerman, 1979) are the two most popular measures of this construct. The former tool is a full-scale 28-item measure, whereas the latter tool is a 10-item subscale of the Sensation Seeking Scale (Zuckerman, 1979). The authors of the BPS define trait boredom as “the tendency toward[s] experiencing boredom” (Farmer & Sundberg, 1986, p. 5), and the author of the ZBS defines trait boredom as “the aversion for repetitive experiences of any kind, routine work, or dull and boring people and extreme restlessness under conditions when escape from constancy is impossible” (Zuckerman, 1979, p. 103). The BPS definition suggests that individuals high in trait boredom are more likely to experience state boredom or experience state boredom more intensely, whereas the ZBS definition suggests that individuals high in trait boredom are more intolerable of under-stimulating and repetitive situations, such that they will feel more bored and restless when in such situations.

However, empirical work not only complicates some of these definitions, but also sheds light on the shortcomings of these two measures. For example, Mercer-Lynn, Bar, and Eastwood (2014) found that trait boredom—regardless of whether it was measured by the BPS or ZBS— independently predicted the intensity of state boredom, but it did not interact with a boring situation in the prediction of state boredom intensity. Mercer-Lynn and her colleagues (2014) suggested that, perhaps, “characteristics of the situation and a person’s propensity to boredom

contribute independently to boredom” (p. 124) and that there are two distinct types of state boredom distinguished by cause: situation-based and person-based (Mercer-Lynn, Bar, & Eastwood, 2014). Thus, this study suggests that the BPS and ZBS do not simply measure the likelihood that someone will feel more intensely bored after a boring situation. Other work finds that the BPS and ZBS are not highly correlated with one another, with bivariate correlations ranging from .17 to .29 (Farmer & Sundberg, 1986; Kass & Vodanovich, 1990; Mercer-Lynn et al., 2014; Mercer & Eastwood, 2010; Mercer-Lynn, Flora, Fahlman, & Eastwood, 2011), and that the ZBS possesses poor reliability (e.g., coefficient alpha has been reported to range from .56 to .65; 3-week test-retest reliability at .70; Mercer-Lynn et al., 2011; Mercer-Lynn et al., 2014). Moreover, the two measures are not only differentially predicted by psychosocial problems (e.g., the BPS is *positively* predicted by experiential avoidance and neuroticism, whereas the ZBS is *negatively* predicted by experiential avoidance and neuroticism; Mercer-Lynn et al., 2011), but they also predict different psychosocial outcomes (e.g., the BPS predicts the internalizing problem of depressed mood, whereas the ZBS predicts the externalizing problem of anger; Mercer-Lynn, Hunter, & Eastwood, 2013). Close comparison of the measures suggests that the BPS items tap an individual’s inability to become meaningfully engaged with his/her experience, whereas the ZBS items tap an individual’s tendency to be uncomfortably under-aroused in under-stimulating environments (Hunter et al., 2016). Taken together, the BPS and ZBS appear to be based on notably different conceptualizations of trait boredom.

Development of the Short Boredom Proneness Scale

In addition to the above-reviewed differences between the BPS and ZBS and the psychometric limitations of the ZBS, there is research suggesting that the BPS does not constitute a single scale, but is a multi-factorial inventory (Ahmed, 1990; Vodanovich & Kass,

1990). Confirmatory factor analyses provide no support for the unidimensionality of the BPS (Gana et al., 2019) that would reflect the original conceptualization of the scale as a measure of a general personal tendency to become bored (Farmer & Sundberg, 1986). Relatedly, the BPS factor structure appears to be highly unstable, with previous studies having identified between two and six factors (Ahmed, 1990; Gana & Akremi, 1998; Gordon et al., 1997; Melton & Schelenberg, 2009; Vodanovich, 2003; Vodanovich & Kass, 1990; Vodanovich, Wallace, & Kass, 2005). However, at least two factors, with somewhat consistent item loadings, have been observed with some regularity across multiple studies. These factors have been construed to represent a lack of internal stimulation (internal factor), which assesses an individual's inability to self-generate interest and engagement, and a lack of external stimulation (external factor), which assesses an individual's inability to satisfy a high need for challenge, change, and excitement (Vodanovich & Kass, 1990; Vodanovich et al., 2005). This internal versus external distinction is purported to contrast two subjective states of boredom, respectively: (a) an apathetic state and (b) an agitated state in which the individual is motivated to engage in their environment but cannot (Danckert, 2013; Greenson, 1953).

In order to address the inconsistency in the factor structure of the 28-item BPS, Vodanovich, Wallace, and Kass (2005) created the 12-item Boredom Proneness Scale-Short Form (BPS-SR) that consists of two factors, with six items from the original BPS scale contributing to each factor. However, both confirmatory factor analyses and prior factor structures have yielded a poor model fit, suggesting that the BPS-SR does not have a replicable factor structure (Gana et al., 2019; Melton & Schulenberg, 2009). Most notably, the conceptual internal-external distinction is complicated by a methodological problem, as all items that consistently load on the internal stimulation factor are worded to require reverse scoring.

Although reverse wording is often employed to combat a number of participant response biases, several studies have raised concerns about whether this method reduces scale score reliability and validity and creates artificial factor structures (e.g., Harvey, Billings, & Nilan, 1985; Schriesheim & Hill, 1981; van Sonderen, Sanderman, & Coyne, 2013).

Accordingly, Struk and colleagues (2015) modified the wording of the previously reverse-scored BPS-SR and BPS items, such that no items required reverse scoring. Exploratory factor analyses, IRT analyses, and confirmatory factor analyses led to the development of the eight-item, single-factor, consistently worded Short Boredom Proneness Scale (SBPS; Struk et al., 2015). The authors purported that the measure clarifies the construct of boredom propensity, suggesting that the construct is better characterized by a single component—an individual's wanting, but failure, to engage in sufficiently satisfying activity (Eastwood et al., 2012). The SBPS has been demonstrated to have good-to-excellent internal consistency and a construct validity that is comparable to the original BPS (Struk et al., 2015).

Defining Trait Boredom through Understanding State Boredom

Despite the development of the SBPS, which is currently the most reliable and valid published measure of trait boredom, it is critical to acknowledge that the BPS (and hence, the SBPS) and ZBS were developed decades prior to there being a definition of state boredom (Fahlman et al., 2013) and an understanding of the experience and function of state boredom. The importance of connecting the conceptualization of trait boredom to the conceptualization of state boredom can be understood in the broader discussion of states versus traits.

In general, states are regarded as temporal cross sections in the stream-of-life of a person (Thorne, 1966). An emotional state, more specifically, exists at a given moment in time and at a particular level of intensity. For example, anger is an emotional state characterized by varying

intensities of subjective feelings (e.g., irritation, annoyance, fury, rage) and cognitive distortions (e.g., jumping to conclusions, catastrophizing, selective attention, overgeneralization, etc.), and it is also characterized by the activation or arousal of the sympathetic nervous system (Spielberger, Jacobs, Russell, & Crane, 1983). Although states are often temporary, they can recur when evoked by appropriate stimuli and they can endure over time when the evoking conditions persist. In contrast to the transitory nature of emotional states, personality traits can be conceptualized as relatively enduring differences among people in specifiable tendencies to perceive the world in a certain way and in tendencies to react or behave in a specified manner with predictable regularity. Allport and Odbert (1936) defined states as “present activity, temporary states of mind, and mood”, but characterized traits as “consistent and stable modes of an individual’s adjustment to his environment” (p. 26). Personality traits have the characteristics of a construct that Atkinson (1964) calls “motives”, which are defined as dispositional response tendencies that are latent until the cues of a situation activate them. Whereas state anger is a transient condition varying in intensity, trait anger refers to individual differences in the propensity to perceive situations as anger provoking and to respond with maladaptive expressions of anger, such as anger suppression (e.g., secretly harbouring grudges) or anger explosion (e.g., losing one’s temper; Spielberger et al., 1983). Differentiating state anger and trait anger by how intensely a person experiences the state versus how a person tends to respond to situations that evoke the state, respectively, can be applied in the same manner to state and trait boredom.

Affectively, state boredom is aversive (Harris, 2000; Mikulas & Vodanovich, 1993; Pekrun, Goetz, Daniels, Stupnisky, & Perry, 2010; Todman, 2003) and it often co-occurs with negative (rather than positive) feelings, such as loneliness, anger, sadness, and worry (Chen et al.,

2017); this latter finding is consistent with research that suggests that respondents will frequently report emotional blends of the same valence (i.e., more often than instances of pure affects, participants will report either multiple negative feelings or multiple positive feelings; Watson & Stanton, 2017). Moreover, state boredom is characterized by dissatisfaction with one's present state and the sense that one cannot escape such an undesirable state (Eastwood et al., 2012; Todman, 2003; Vogel-Walcutt, Fiorella, Carper, & Schatz, 2012), which create the feeling of distress (Bench & Lench, 2013). One feels tired and lethargic but also restless/impulsive, anxious, irritable, and frustrated with his/her situation (Goetz & Frenzel, 2006; Harris, 2000; Martin, Sadlo, & Stew, 2006; Moynihan, Igou, & Van Tilburg, 2017; Steinberger, Moeller, & Schroeter, 2016; Van Tilburg & Igou, 2012). Cognitively, state boredom is characterized by difficulties in concentrating and maintaining attention (Ahmed, 1990; Damrad-Frye & Laird, 1989; Eastwood et al., 2012; Hamilton, 1981; Hamilton et al., 1984; Harris, 2000; Wallace, Vodanovich, & Restino, 2003), the perception of a slower or non-existent passage of time (Greenson, 1953; Hartocollis, 1972; Tze, Daniels, Klassen, & Johnson, 2013; Wangh, 1975), mental fatigue, and mind-wandering (Fan, Zhou, Liu, & Xie, 2015; Game, 2007; Harris, 2000; Martin et al., 2006). Physiologically, boredom has been described as a state of low arousal (Hebb, 1955; Mikulas & Vodanovich, 1993), high arousal (Bench & Lench, 2013; O'Brien, 2014), or both low and high arousal (Danckert, Hammerschmidt, Marty-Dugas, & Smilek, 2018; Eastwood et al., 2012; Elpidorou, 2014; Fahlman et al., 2013; Goetz et al., 2014; Van Tilburg & Igou, 2012), and it is linked to both decreased and increased levels of physiological arousal (Giakoumis et al., 2010; Lundberg, Melin, Evans, & Holmberg, 1993; Pattyn, Neyt, Henderickx, & Soetens, 2008).

Despite these characteristics, a review of theoretical and empirical literature by Bench and Lench (2013), Danckert and colleagues (2018), and by Elpidorou (2014, 2018a, 2018b) suggests that state boredom is functional, such that it is both informative and regulatory of one's behaviour. In line with the above-reviewed definition (page 3) and characteristics of state boredom (page 9), the feeling of boredom informs an individual that he/she is dissatisfied with what he/she is currently doing or with whatever options for cognitive engagement lie in front of that individual. As Van Tilburg and Igou (2012) showed, boredom is differentiated from anger, frustration, and sadness insofar as it is the only state that involves a perception that one's situation is unchallenging and meaningless (see also Van Tilburg & Igou, 2017). The individual is not only cognitively disengaged, but is also dissatisfied and feels that dissatisfaction as negative affect (Danckert et al., 2018). Moreover, while they are all born out of disengagement from one's surroundings, boredom is proposed to be different from apathy, anhedonia, and depression because it involves a strong drive to do something that is more engaging (Bench & Lench, 2013; Elpidorou, 2014). To put it another way, boredom would not occur without the motivation or desire to have one's cognitive faculties engaged in the pursuit of some goal. Thus, state boredom is also proposed to operate as a self-regulatory signal to control an individual's behaviour—to escape the aversive feeling of boredom and articulate and pursue a goal that would engage one's cognitive faculties (Danckert et al., 2018). It serves to restore one's perception that his/her activities are cognitively engaging, meaningful, and aligned with his/her interests and desires (Bench & Lench, 2013; Elpidorou, 2014; Elpidorou, 2016; Smith, Wagaman, & Handley, 2009; Van Tilburg & Igou, 2011; Van Tilburg & Igou, 2012).

However, similar to the feeling of anger, boredom becomes problematic when an individual adopts maladaptive responses in their attempt to escape the feeling; and the individual

will try, if possible, to escape from his/her boredom experience. For example, one study found that when participants were forced to spend 15 minutes alone with only their thoughts, they were willing to self-administer electric shocks that they had earlier said they would pay to avoid (Wilson et al., 2014). Another study found that individuals in a monotonous, boring condition ate more chocolate and shocked themselves both more often and with higher intensity than individuals in the neutral condition (Havermans, Vancleef, Kalamatianos, & Nederkoorn, 2015). The authors from both studies concluded that boredom is such a distressing state that some individuals would choose negative stimuli in order to alleviate it. A third study found that only the onset of boredom—and not that of sadness—increased the number of voluntary self-administered electric shocks, with the authors concluding that individuals choose to harm themselves not to avoid emotional experiences in general, but to specifically escape the feeling of boredom (Nederkoon, Vancleef, Wilkenhöner, Claes, & Havermans, 2016).

Synthesizing the reviewed literature: State boredom is proposed to be a self-regulatory signal that is meant to push an individual to seek satisfaction and optimal use of his/her cognitive resources—but it can also lead an individual to try to escape a boring situation through maladaptive means. This could mean that trait boredom, then, represents a *chronic* disposition toward responding to state boredom in maladaptive (responses that reduce the state but are linked to harmful/unhealthy outcomes) and/or ineffectual (responses that are ineffective at reducing the state) ways (Danckert et al., 2018). Furthermore, as reviewed earlier, existing measures of trait boredom (the BPS and ZBS) do not interact with a boring situation in the prediction of the how intensely an individual experiences state boredom (Mercer-Lynn et al., 2014). Yet, existing measures of trait boredom (the SBPS) may very well interact with a boring situation in the prediction of how an individual responds, or is motivated to respond, to the situation. In other

words, while state boredom is an important signal that is purported to lead to adaptive behaviours (though, not always), and while one's level of trait boredom does not moderate the impact of the current situation on the experience of state boredom (i.e., boredom intensity), one's level of trait boredom may moderate the impact of the current situation on his/her motivations to respond in certain ways to the elicited state (i.e., boredom). This way of thinking about trait boredom not only links state boredom and trait boredom, but also provides a coherent and parsimonious explanation for the myriad associations between trait boredom and the negative affective states and psychosocial outcomes reviewed earlier (page 3).

Trait Boredom: How are Individuals Motivated to Respond to a Boring Situation?

The above-reviewed functional account of state boredom and literature on existing measures of trait boredom offer a testable way of thinking about trait boredom: If state boredom is a signal to an individual to do something that is more cognitively engaging than one's current activity, and if trait boredom and one's current situation do not interact in predicting his/her boredom intensity, then trait boredom and one's current situation may interact in predicting his/her motivations to respond in certain ways. Although the SBPS was designed to measure the tendency for an individual to want, but fail, to engage in sufficiently satisfying activity (Struk et al., 2015), the current study explored whether the SBPS interacts with the situation in predicting one's experience of state boredom or one's motivations to respond (termed *response motivations*) to a boring (or non-boring) situation in certain ways².

² As indicated previously, responses to state boredom may be maladaptive, in that the individual engages in behaviours that reduce the state but are linked to unhealthy/harmful outcomes, or may be ineffectual, in that the individual engages in behaviours that do not reduce the state (and hence, the state persists). It is likely that the response motivations selected for the current study are more or less adaptive or effective, but they were not explicitly grouped as maladaptive or ineffectual. The current study was primarily focussed on further informing what the SBPS measures (i.e., if it interacts with the situation in predicting individuals' response motivations).

In the current study, the experience of state boredom was operationalized as the participant's boredom intensity, as well as the participant's valence, arousal, and distress, at the time of report. The research on the impact of induced boredom on individuals' behaviours is limited (Bench & Lench, 2013), has been inconsistent on precisely how individuals respond to boredom (i.e., whether boredom motivates approach or avoidant behaviours; Britton, unpublished Master's Thesis; Gasper & Middlewood, 2014). Thus, based on an understanding of the above-described characteristics and function of state boredom and on this limited research, the current study included a wide range of plausible (but perhaps, contradictory) response motivations.

Seek meaning. One area of research that has examined individuals' responses to state boredom suggests that the feeling of boredom is not only related to a perception of a lack of meaning, but can also give rise to various attempts to reestablish a sense of meaningfulness. In a series of studies, Van Tilburg and colleagues (2011, 2012, 2013) found that participants sought out more meaningful outcomes after a boredom induction. In one study, participants in the "high state boredom" condition, as opposed to the "low state boredom" condition, were more favourable of ethnic ingroup members and treated ethnic outgroup members more harshly, as group membership provides a sense of meaning (Van Tilburg & Igou, 2011). In another study, induced boredom caused increases in nostalgia when participants had the opportunity to revert to their past, and the search for meaning mediated the effect of state boredom on nostalgic memory content (Van Tilburg, Igou, & Sedikides, 2013). Thus, this suggests that being in a boring situation motivates individuals to engage in behaviours that provide a sense of meaning.

Seek creativity. Existing research on state boredom and creativity is mixed and thus, it is not possible to reach definitive conclusions. Harris (2000) found that participants report

increased creativity when asked about the subjective positive outcomes of boredom. Larson (1990) asked students to report their levels of boredom at four time points while writing an essay. After each report of boredom, students handed in a draft of their work and independent judges evaluated the originality, organization, and overall quality of the essays. Higher levels of boredom were associated with lower quality essays. Yet, a limitation of this study is that boredom was not experimentally induced, which leaves open the possibility that, for example, the lack of creativity resulted in boredom. Gasper and Middlewood (2014) induced boredom, elation, distress, and relaxation among participants by asking them to watch different video clips. Boredom and elation were grouped together as *promotion-focused* emotions (i.e., emotions motivated by the attempt to obtain something desirable) and distress and relaxation were grouped together as *prevention-focused* emotions (i.e. emotions motivated by the attempt to avoid something undesirable). The study found that promotion-focused emotions were associated with more creativity (i.e., associative thought) than prevention-focused emotions. However, because elation was always paired with boredom in the statistical analyses, the study did not demonstrate the effect of only induced boredom on creativity. Finally, Mann and Cadman (2014) induced boredom in half of their participants by asking them to read out or write out numbers from a telephone book for 15 minutes before asking them to think of as many alternate uses as they can for an everyday object; the other half of participants simply completed the ‘alternate uses’ task, which is an indirect measure of creativity. The authors then focused on those participants in the boredom condition who also reported daydreaming during the induction; here, the authors’ proposed that daydreaming is a way to eliminate boredom and that daydreaming might, in turn, facilitate creativity. As predicted, participants who were bored *and* reported daydreaming demonstrated greater creativity than participants who did not undergo the emotion manipulation.

Importantly, the creativity level of those participants who did not escape induced boredom by daydreaming is unknown, so it is impossible to know the effect of only boredom on individuals' creative abilities. As a result, it appears that these studies do not provide compelling evidence that being bored enhances creativity. However, in keeping with the above-described signal of state boredom, it may be that, like daydreaming, individuals are motivated to seek creative activities to escape the feeling of boredom and avoid further boredom (Danckert et al., 2018).

Seek sensation. The above-reviewed study by Gasper and Middlewood (2014) found that the effect of boredom-elicitation scores on creativity was mediated by individuals' in-the-moment desire for new experiences, defined as sensation seeking. Furthermore, as described above, the most contentious feature regarding the experience of boredom is its relationship to arousal: Boredom has been characterized as a state of low arousal, high arousal, or both. A literature review indicates that most definitions of boredom are ones that render it a state of low arousal (see references in Vogel-Walcutt et al., 2012), but both quantitative and qualitative data on the experience of boredom (Harris, 2000; Martin et al., 2006; Moynihan et al., 2017; Steinberger et al., 2016; Van Tilburg & Igou, 2012) do not provide conclusive support for the claim that boredom should be understood as a low arousal state. Arousal theories propose that boredom is caused by a mismatch between an individual's need for arousal and the availability of environmental stimulation (Berlyne, 1960; Csikszentmihalyi, 1975; Csikszentmihalyi, 1990; De Chenne, 1988; Hebb, 1966; Klapp, 1986; Zuckerman, 1979). Thus, one plausible response to a cognitively under-stimulating situation is to seek energizing opportunities, which points to the function of boredom as inspiring a search for "change and variety" (Harris, 2000, p. 578).

Seek relief (behavioural inhibition/avoidance). Goal regulation accounts of motivation and behaviour (Corr, 2009; Gray & McNaughton, 2000) propose that *anxious uncertainty* arises

when a conflict threatens the progress of one's goals. As reviewed above, the aversive experience of boredom is also related to goal conflict, in that it signals a detected discrepancy between one's current and desired states of cognitive engagement (Bench & Lench, 2013; Danckert et al., 2018). When it arises, anxious uncertainty is characterized by generalized avoidance, such as goal disengagement, aversive arousal, and decreased likelihood of persistence at any one task (Corr, 2004; Corr, 2008; Gray & McNaughton, 2000), and individuals feel uninspired and uncertain when thinking about what they might like to do (DeYoung, 2015; Hirsh, Mar, & Peterson, 2012). When one is overly sensitive to the detection of discrepancies between current and desired cognitive engagement, he/she may experience boredom more often and more intensely than is functionally adaptive. Indeed, at the trait-level, greater boredom propensity (as measured by the BPS) is related to a highly sensitive behavioural inhibition system, which mediates anxiety-related processes, such as avoidance behaviours (BIS; Gray & McNaughton, 2000; Mercer-Lynn et al., 2013; Mercer-Lynn et al., 2014). At the state level, one study found that situationally induced boredom was robustly correlated with state anxious uncertainty at $r = .40$ ($p < .001$) and the author proposed that boredom could be thought of as a state of anxious uncertainty (Britton, unpublished Master's Thesis). Accordingly, one plausible response to induced boredom is inhibited/avoidant behaviours (e.g., seeking relief or comfort).

Seek destruction/release frustration (reactive behavioural activation/approach). In the same study noted above, situationally induced boredom was negatively associated with state *approach motivation* (Britton, unpublished Master's Thesis). Approach motivation energizes behaviours that push an individual towards desired end states when goal pursuit is perceived as un-conflicted and clear (DeYoung & Gray, 2009; Jonas et al., 2014). Individuals are motivated to seek out stimuli to approach even in the absence of any immediate cue (Harmon-Jones,

Harmon-Jones, & Price, 2013). Yet, when approach motivation is low, it leaves individuals more susceptible to BIS-activating behaviours that might intensify anxious arousal, which lends further support to the idea that people will respond to situationally induced boredom in inhibiting, avoidant ways.

However, induced boredom may be positively related to a specific form of approach motivation. Empirical work on *reactive approach motivation* (RAM; McGregor, Nash, Mann, & Phillips, 2010) posits that when individuals experience motivational conflict and uncertainty, they seek to relieve the aversive feeling by engaging in fervent displacements behaviours. As reviewed above, the motivation to relieve the aversive state of boredom is so strong that individuals will engage in affectively *negative* approach behaviours, such as self-administering electric shocks (Havermans et al., 2015; Nederkoon et al., 2016; Wilson et al., 2014), presumably to mitigate the elicited anxiety (for a review of how approach motivation may be experienced as positive and negative, see Harmon-Jones et al., 2013). The comforting nature of these approach behaviours can lead individuals to act impulsively without regard for long-term outcomes or priorities (McGregor, et al., 2010). And although individuals often comment that they feel tired and weary in a state of boredom, they also report feeling impulsive and frustrated (Goetz & Frenzel, 2006; Harris, 2000; Martin et al., 2006; Moynihan et al., 2017; Steinberger et al., 2016; Van Tilburg & Igou, 2012). Indeed, both experimental and longitudinal data reveal a link between the feeling of boredom and hostile responses towards outgroup members (Van Tilburg & Igou, 2011), delinquent behaviours (Spaeth, Weichold, & Silbereisen, 2015), vandalism (Horowitz & Tobaly, 2003), and destructive and hostile impulses (Boyle, Richards, & Baglioni Jr., 1993). Thus, it follows that individuals in a boring situation would be motivated to engage in destructive or impulsive approach behaviours to release their frustration.

Uncertainty. The above-reviewed functional account of state boredom (Danckert et al., 2018) suggests that the feeling of boredom can be thought of as a failure to satisfy a desire to be engaged with the world (e.g., “a desire for desires” – Tolstoy, 1899). When bored, the individual cannot find anything that they want to do in their current surroundings, but they desperately want to want to do something. This means that the individual may not know *what* it is that they want to do, but they definitely know that they want something to do (Danckert et al., 2018). Hence, another plausible response to the state of boredom is the uncertainty of what to do in that moment (and this is empirically supported by the above-noted link between situationally induced boredom and anxious uncertainty; Britton, unpublished Master’s Thesis).

Amotivation/Avolition (reduced impetus and capacity for goal pursuit). Although past research has demonstrated that boredom is psychometrically distinct from apathy, anhedonia, and depression (Goldberg et al., 2011), it is worth noting that apathy and boredom share some core motivational components. In the same study, Goldberg and colleagues (2011) found that the construct of boredom (comprised of the BPS, a boredom coping scale, and a state boredom scale) was significantly correlated with only the Behaviour subscale of the Apathy Evaluation Scale ($r = .22, p < .001$), which taps into motivational deficits in goal-directed behaviour (Marin, 1990; Marin, 1991; Marin, Biedrzycki, & Firinciogullari, 1991). What this suggests is that boredom also entails some reduced impetus to initiate and sustain overt goal-directed behaviours—i.e., *amotivation*, a term often used interchangeably with *avolition* in clinical practice and in research (Foussias & Remington, 2010)³. Phenomenologically, it is possible to

³ It should be noted that the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) defines *avolition* as an “inability to initiate and persist in goal-directed activities” (American Psychiatric Association, 2013, p. 818), suggesting that avolition involves an impaired ability to enact motivated action (Liddle et al., 1992) rather than a deficit of motivation. Yet, the DSM-5 also describes avolition as “reduced drive to perform goal-directed behaviour” (p. 100),

have a desire to act (i.e., a motivation) without acting on it or to fail to act for any number of reasons. Internal impediments to action may be considered “volitional” to the extent that they do not reflect a simple lack of motivation to act in the first place or the presence of conflicting motivations (e.g., fear or avoiding harm). Within both leisure and academic contexts, amotivation and the lack of intrinsic (internally-driven) motivation are robustly associated with the feeling boredom (Barnett & Klitzing, 2006; Caldwell, Darling, Payne, & Dowdy, 1999; Sharp, Caldwell, Graham, & Ridenour, 2006; Tze, Daniels, & Klassen, 2016; Vallerand & Thill, 1993). Thus, although boredom is proposed to act as a self-regulatory signal that pushes an individual to partake in an alternative engaging activity, a possible response to a boring situation is the inability to translate that push into an actionable desire.

Current Study

The current paper sought to further inform our understanding of the SBPS; that is, exploring whether the SBPS moderates the impact of the current situation on individuals’ experience of state boredom or individuals’ response motivations (motivations to respond to the boring versus non-boring situation in particular ways). The former outcome was operationalized as the intensity of participants’ state boredom, valence, arousal, and distress. The latter outcome was operationalized as: the motivation to do something meaningful (seek meaning), the motivation to do something creative (seek creativity), the motivation to do something exciting/energizing (seek sensation), the motivation to behaviourally inhibit/withdraw (seek relief; behavioural avoidance), the motivation to do something destructive to release frustration (seek destruction/release frustration; reactive approach motivation; RAM), as well as uncertainty

suggesting a lack of motivation. The ambiguity of this two-pronged definition of avolition—as both a lack of ability and a lack of impetus—remains an unresolved conceptual issue.

of what to do in the current moment (uncertainty), and not being able to launch into any activity (amotivation/avolition).

Participants were randomly assigned to a boredom group or a non-boredom group after completing the SBPS. Participants in the boredom group watched a video clip of an employee describing his job at an office supply company, whereas participants in the non-boredom group watched a video clip from a comedy sitcom. All participants completed ratings of their boredom intensity, valence, arousal, distress, and response motivations immediately before and immediately after watching their assigned video clip. Given that boredom co-occurs with negative (rather than positive) feelings (Chin et al., 2017; Watson & Stanton, 2017), participants also rated the intensity of other discrete feelings before and after the experimental manipulation. The current study explored the following research questions:

- (1) What impact does a boring (versus non-boring) situation have on an individual's state boredom experience (intensity, valence, arousal, and distress) and response motivations?
This question is particularly important, given that the impact of induced boredom on behaviour (i.e., motivational or amotivational pursuit of activities and goals) has received little research attention (Bench & Lench, 2013).
- (2) What is the relationship between trait boredom (as measured by the SBPS) and an individual's state boredom experience (intensity, valence, arousal, and distress) and response motivations after boring and non-boring situations?
- (3) Does trait boredom (as measured by the SBPS) moderate the impact of a boring situation? If so, what aspect of the situation is moderated – an individual's state boredom experience (intensity, valence, arousal, and distress) or response motivations?

Methods

Participants

Ethics approval was received from the Human Participants Review Committee at York University (ethics certificate # 2018-252). All participants were York University undergraduate students recruited from the Undergraduate Research Participant Pool or from an advertisement posted across York University's campus and on York-affiliated social media platforms (e.g., undergraduate psychology Facebook groups); participants received either academic credit or \$15 dollars for participation. All participants provided written consent and were strangers to the research team and principle investigator.

In total, 459 participants ($M_{\text{age}} = 20.63$, $SD_{\text{age}} = 4.16$, 80% Female⁴) completed the experiment. Out of those, seven participants were removed due to incomplete data and 17 participants were removed due to data collection errors that rendered the experimental manipulation (i.e., the Boredom Induction, described below) invalid (e.g., the participant was on his/her phone during the induction, the headphones did not work during the induction, etc.).

Trait Measures⁵

Trait boredom. The original Boredom Proneness Scale (BPS; Farmer & Sundberg, 1986) is a 28-item measure of an individual's propensity towards boredom. Struk and colleagues (2015) created an eight-item, single-factor version of the BPS, the Short Boredom Proneness Scale (SBPS). The measure includes items such as, "I find it hard to entertain myself", rated on a scale ranging from 1 (*Strongly Disagree*) to 7 (*Strongly Agree*). The authors report that higher

⁴ No concrete hypotheses about gender differences were made. Gender data was collected and is reported to describe the diversity of the sample.

⁵ As part of a battery of trait measures, all participants also completed questionnaires about self-control, conscientiousness, self-regulation of feelings, thoughts, and behaviours, and personal agency. These data were not used in the analyses for this study.

scores are indicative of the tendency for an individual to want, but fail, to engage in sufficiently satisfying activity. The SBPS has been demonstrated to have a construct validity that is comparable to the original BPS score, with the SBPS being appropriately and significantly correlated with indices of aggression, depression, anxiety, stress, symptoms of attention deficit hyperactivity disorder (ADHD), spontaneous mind-wandering, and lapses of attention (Struk et al., 2015). It is also reported to have a good-to-excellent internal consistency, with α ranging from 0.87 to 0.92 (Elhai, Vasquez, Lustgarten, Levine, & Hall, 2018; Struk et al., 2015; Van Tilburg, Igou, Maher, Moynihan, & Martin, 2019; Wegmann, Ostendorf, & Brand, 2018). In the current sample, the internal consistency of the SBPS was good, with $\alpha = 0.89$. See Appendix A for all eight SBPS items.

State Measures

Emotion “probe”: Subjective feelings and response motivations. Each participant completed a “probe” used to assess how intensely bored he/she was feeling and how he/she wanted to respond in that very moment. Participants completed the “probe” twice in the experiment. Forty items were originally created. These 40 items were reviewed and revised within group meetings composed of a professor and graduate students who were knowledgeable about the boredom literature and actively studying boredom. After revisions, 17 items that were judged to be coherent, readable, and representative of the outcomes of interest were retained. All 17 items⁶ (see Appendix B for the items) were rated on a 7-point Likert-type scale. Seven items assessed how intensely the participant was feeling bored in the current moment, as well as six

⁶ For all participants, the order of the 17 probe items was randomized by each category of items. That is, participants first rated the intensity of their feelings and the order of these seven items was randomized. Next, participants rated their valence, arousal, and distress, and the order of these three items was randomized. Finally, participants rated their response motivations, and the order of these seven items was randomized.

other discrete feelings (i.e., happy, interested, sad, frustrated, indifferent, disgusted). One item each assessed how negative-positive (valence; higher score indicated feeling more positive), energized (arousal; higher score indicated feeling more energized), and distressed (higher score indicated feeling more distressed) the participant was feeling. Finally, seven items assessed what the participant would want to (if given the choice) do in the current moment; here, participants rated a total of seven response motivations: the motivation to do something meaningful (seek meaning), the motivation to do something creative (seek creativity), the motivation to do something exciting/energizing (seek sensation), the motivation to behaviourally inhibit/withdraw (seek relief; behavioural avoidance), the motivation to do something destructive to release frustration (seek destruction/release frustration; RAM), not knowing what to do (uncertainty), and not caring to do anything at all (amotivation/avolition). A higher score on any of the items was indicative of greater move towards a certain response.

Experimental Manipulation: Boredom Induction

All participants were randomly assigned to one of two “mood induction” conditions. That is, participants were induced into a state of boredom or a control state (amusement) through a brief (4 minute and 50 second long) video clip. All participants were first told the following: “We are interested in how your personality and mood affect how you experience different kinds of tasks. Today, you will watch a video, and you will be asked to pay attention so that you can remember key details from the video. Please pay close attention, as you will be asked questions about the video you watch.” Participants did not actually answer any questions about the video that they watched; the instructions were provided to ensure that participants attended to the clip.

Participants in the “boredom” condition ($N = 245$) watched a video of a man talking about his work at an office supply company. He describes, in a monotone and “boring” manner

(Leary, Rogers, Canfield, & Coe, 1986), a conversation with a client, eating lunch at his desk, and the determinants of cardstock prices. This clip has been shown to possess both intensity (i.e., high reported boredom ratings) and discreteness (i.e., experiencing boredom as opposed to other feelings; Markey, Chin, VanEpps, & Loewenstein, 2014). Participants in the “amusement” condition ($N = 190$) watched the first 4 minutes and 50 seconds of the first episode of the comedy sitcom *Brooklyn Nine-Nine* (Goor, Schur, Lord, & Miller, 2013). Prior work comparing these two experimental groups has revealed that participants who watch the boring video clip report significantly higher state boredom scores than participants who watch the amusing video clip (Hunter, Dyer, Cribbie, & Eastwood, 2015).

Procedure

Participants completed all self-report measures (trait and state) on a desktop computer in a lab room within one research session. The research session ranged from 60 to 90 minutes. The entire study was programmed with Qualtrics (Qualtrics, Provo, UT).

Upon providing consent, participants completed a basic demographic questionnaire, followed by a battery of trait measures, including the SBPS. Then, participants completed one of the two probes (*pre-video probe*). They were then randomly assigned to watch either the boring or non-boring (amusing) video clip; the research assistant provided each participant with the above-quoted instructions and then left the room to allow the participant to watch the assigned video clip with headphones. Immediately following the video clip, participants completed the second probe (*post-video probe*). To ensure the highest quality of data, participants answered a final question querying if they were able to follow the study instructions. Finally, participants were debriefed and compensated for their time.

Results

Statistical Assumptions

Unless otherwise noted, all statistical assumptions were met. All statistical analyses were conducted on SPSS. Effect sizes were interpreted using guidelines from Cohen (1988) and Sawilowski (2009).

Table 1 presents the average intensity scores of the seven feelings assessed during the pre-video probe and post-video probe for participants in the boredom and amusement condition, as well as the average valence, arousal, distress, and response motivations scores.

Table 1

Mean scores of Feeling Intensity, Valence, Arousal, Distress, and Response Motivations among Amusement and Boredom Conditions

	Amusement Condition (N = 190)		Boredom Condition (N = 245)	
	Pre-video M(SD)	Post-video M(SD)	Pre-video M(SD)	Post-video M(SD)
Bored (Intensity)	3.43 (1.73)	2.35 (1.58)	3.19 (1.78)	3.71 (1.88)
Happy	3.85 (1.28)	4.98 (1.33)	3.62 (1.43)	3.45 (1.50)
Sad	2.58 (1.71)	1.77 (1.21)	2.62 (1.71)	2.24 (1.62)
Frustrated	2.41 (1.64)	1.72 (1.25)	2.38 (1.72)	2.11 (1.55)
Indifferent	3.61 (1.75)	2.81 (1.58)	3.49 (1.86)	3.66 (1.84)
Disgust	1.65 (1.29)	1.43 (0.93)	1.40 (0.96)	1.40 (0.89)
Interest	4.11 (1.49)	5.01 (1.43)	4.33 (1.56)	3.56 (1.68)
Valence	4.57 (1.47)	5.47 (1.30)	4.66 (1.35)	4.42 (1.34)
Arousal	3.34 (1.42)	4.33 (1.40)	3.40 (1.37)	3.35 (1.45)
Distress	2.77 (1.77)	2.10 (1.44)	2.61 (1.59)	2.60 (1.56)
Seek meaning	5.67 (1.32)	5.66 (1.26)	5.60 (1.44)	5.56 (1.46)
Seek creativity	5.16 (1.60)	5.28 (1.54)	5.00 (1.71)	5.01 (1.73)
Seek sensation	5.42 (1.50)	5.60 (1.33)	5.18 (1.62)	5.39 (1.57)
Seek relief (Beh. inhibition/avoidance)	5.61 (1.38)	5.55 (1.41)	5.69 (1.47)	5.58 (1.46)
Seek destruction/release frustration (RAM)	2.69 (1.94)	2.44 (1.82)	2.58 (1.95)	2.54 (1.92)
Uncertainty	3.58 (2.09)	3.20 (1.88)	3.33 (2.02)	3.41 (1.97)
Amotivation/Avolition	3.19 (1.80)	3.03 (1.83)	3.00 (1.94)	3.19 (1.98)

(1) What Impact does a Boring (versus Non-boring) Situation have on Individuals' State Boredom Experience and Response Motivations?

(a) Boredom intensity, valence, arousal, and distress. Two sets of analyses were conducted to explore the impact of a boring versus non-boring (amusing) situation on participants' boredom intensity, valence, arousal, and distress⁷. The impact of the situation was examined by exploring if there were significant changes within both conditions in an outcome (from the pre-video to post-video probe) and a corresponding significant difference between conditions on the outcome (post-video probe).

First, paired sample *t*-tests were conducted to explore if the experimental manipulation decreased boredom among participants who watched the amusing video clip (Brooklyn Nine-Nine) and increased boredom among participants who watched the boring video clip (Office Supply Company Employee), from the pre-video to post-video probe. Paired samples *t*-tests also explored changes in valence, arousal, and distress among participants in both conditions. Results for these *t*-tests, including effect sizes, are reported in Table 2. Participants in the amusement condition experienced a significant decrease in boredom, a significant increase in valence (feeling more positive), a significant increase in arousal (feeling more energized), and a significant decrease in distress from the pre-video to post-video probes, with a moderate-to-large effect of the amusing video clip on changes in these four aspects of state boredom experience. Participants in the boredom condition experienced a significant increase in boredom and a significant decrease in valence (feeling more negative), with a small-to-moderate effect of the boring video clip on changes in these two aspects of state experience. The boring video clip did

⁷ Independent samples *t*-tests found no group differences in boredom intensity (as well as the intensity of other feelings), valence, arousal, and distress prior to the experimental manipulation (i.e., before the two groups of participants watched their respective video clips), all *p*'s > .05.

not contribute to significant changes in arousal and distress, with only a very small effect of the boring video clip observed.

Second, independent samples *t*-tests were conducted to explore if the experimental groups differed on post-video boredom intensity, valence, arousal, and distress. Results of these *t*-tests, including effect sizes, are reported in Table 3. Participants in the boredom condition felt significantly more bored, less positive, less energized, and more distressed after their video than participants in the amusement condition. There was a moderate-to-large effect of the experimental manipulation on group differences in post-video boredom, valence, and arousal, and a small-to-moderate effect of the manipulation on group differences in post-video distress.

Regarding the other feelings examined in the study, participants in the amusement condition experienced moderate-to-large significant decreases in sadness and frustration, as well as moderate-to-very large significant increases in happiness and interest (see Table 2), whereas participants in the boredom condition experienced modest-to-moderate significant decreases in sadness, frustration, happiness, and interest. Participants in the boredom condition felt significantly more sad, more frustrated, as well as less happy and less interested after watching their video than participants in the amusement condition (Table 3).

These results suggest that the situation that participants were in (boring or amusing) had an impact on boredom intensity and valence: Participants in the amusement condition reported a moderate-to-large decrease in boredom and increase in valence, and participants in the boredom condition reported a small-to-moderate increase in boredom and decrease in valence. After the video, participants in the boredom condition felt more bored and more negative than participants in the amusement condition, as well as less energized and more distressed. The experimental manipulation also made both groups of participants differentially happy and interested, with

moderate-to-very large *increases* in happiness and interest among participants in the amusement condition and very small-to-moderate *decreases* in happiness and interest among participants in the boredom condition; these patterns are consistent with experience sampling research that suggests that the presence of boredom is strongly predictive of the absence of happiness and interest (Chin et al., 2017). The finding that participants in the boredom condition experienced an increase only in boredom—instead of an increase in all negative feelings (i.e., sadness, frustration)—further substantiates the discreteness of the video clip in enhancing boredom (Markey et al., 2014).

Table 2

t-Tests Exploring Changes in Boredom Intensity, Valence, Arousal, Distress, and Response Motivations Among Amusement Condition and Boredom Condition Participants

Change in (From Pre-video to Post Video):	Amusement Condition (<i>N</i> = 190)			Boredom Condition (<i>N</i> = 245)		
	<i>t</i> (189)	<i>p</i>	<i>d</i>	<i>t</i> (244)	<i>p</i>	<i>d</i>
Bored (Intensity)	9.00	< .001	0.65	-4.20	< .001	-0.27
Happy	-13.11	< .001	-0.95	2.20	.029	0.14
Sad	8.94	< .001	0.65	4.56	< .001	0.29
Frustrated	6.98	< .001	0.51	3.01	.003	0.19
Indifferent	6.15	< .001	0.45	-1.54	.125	-0.10
Disgust	3.61	< .001	0.26	.15	.878	0.01
Interest	-8.20	< .001	-0.59	7.08	< .001	0.45
Valence	-10.14	< .001	-0.74	3.24	.001	0.21
Arousal	-9.56	< .001	-0.69	.57	.572	0.04
Distress	7.14	< .001	0.52	.09	.925	0.01
Seek meaning	.07	.949	0.00	.36	.721	0.02
Seek creativity	-1.21	.228	-0.09	-.14	.893	-0.01
Seek sensation	-1.98	.049	-0.14	-2.37	.018	-0.15
Seek relief (Beh. inhibition/avoidance)	.62	.539	0.04	1.13	.261	0.07
Seek destruction/release frustration (RAM)	2.58	.011	0.19	.42	.677	0.03
Uncertainty	3.02	.003	0.22	-.73	.466	-0.05
Amotivation/Avolition	1.36	.174	0.10	-1.70	.090	-0.11

Table 3

t-Tests Exploring Differences between Amusement and Boredom Conditions on Post-Video Boredom Intensity, Valence, Arousal, Distress, and Response Motivations

Post-Video Scores:	Amusement Condition (N = 190)	Boredom Condition (N = 245)	<i>t</i> (433) ^a	<i>p</i>	<i>d</i>
	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)			
Bored (Intensity)	2.35 (1.58)	3.71 (1.88)	8.21	< .001	0.78
Happy	4.98 (1.33)	3.45 (1.50)	-11.24	< .001	1.08
Sad	1.77 (1.21)	2.24 (1.62)	3.47	.001	0.33
Frustrated	1.72 (1.25)	2.11 (1.55)	2.90	.004	0.28
Indifferent	2.81 (1.58)	3.66 (1.84)	5.08	< .001	0.50
Disgust	1.43 (0.93)	1.40 (0.89)	-.41	.684	0.03
Interest	5.01 (1.43)	3.56 (1.68)	-9.73	< .001	0.93
Valence	5.47 (1.30)	4.42 (1.34)	-8.19	< .001	0.80
Arousal	4.33 (1.40)	3.35 (1.45)	-7.12	< .001	0.69
Distress	2.10 (1.44)	2.60 (1.56)	3.49	.001	0.33
Seek meaning	5.66 (1.26)	5.56 (1.46)	-.77	.443	0.07
Seek creativity	5.28 (1.54)	5.01 (1.73)	-1.68	.094	0.16
Seek sensation	5.60 (1.33)	5.39 (1.57)	-1.50	.135	0.14
Seek relief (Beh. inhibition/avoidance)	5.55 (1.41)	5.58 (1.46)	.26	.794	0.02
Seek destruction/release frustration (RAM)	2.44 (1.82)	2.54 (1.92)	.56	.574	0.05
Uncertainty	3.20 (1.88)	3.41 (1.97)	1.12	.266	0.11
Amotivation	3.03 (1.83)	3.19 (1.98)	.87	.384	0.08

Note. ^a Levene's Test for Equality of Variances revealed unequal variances across experimental groups on post-video boredom, sadness, frustration, happiness, and interest, as well as post-video motivations to seek meaning and seek sensation. Thus, *t*-tests utilizing un-pooled variances and a correction to the degrees of freedom were conducted for these outcomes.

(b) Response motivations. Similar to the results presented thus-far, paired sample *t*-tests examined the impact of the experimental manipulation on changes in response motivations (from the pre-video to post-video probes) among participants in both conditions (Table 2), and independent samples *t*-tests examined group differences in post-video response motivations (Table 3)⁸.

Among participants in the amusement condition, there were significant decreases from pre-video to post-video in the motivation to do something destructive to release one's frustration and in one's uncertainty of what to do, as well as a significant increase in the motivation to do something exciting/energizing (seek sensation), with a modest effect of the amusing video clip observed on changes in these response motivations. Among participants in the boredom condition, there was only a significant increase in the motivation to seek sensation from pre-video to post-video, with a very small effect of the boring video clip on the changes in this response motivation. Changes in all other response motivations within each condition were non-significant, with very small effects (i.e., $d < 0.21$) of each video clip observed (Table 2)

Independent samples *t*-tests found no significant group differences in post-video response motivations, with very small effects (i.e., $d < 0.17$) of the experimental manipulation observed (Table 3).

As a result, these results and the foregoing results suggest that one's situation—boring or not—is impactful of the changes in one's boredom and concomitant valence, arousal, and distress from pre-video to post-video, but not the changes in one's motivation to respond in certain ways. Furthermore, whereas participants in the boredom condition felt more bored, more negative, less energized, and more distressed after their video clip than participants in the

⁸ Independent samples *t*-tests found no group differences in response motivations prior to the experimental manipulation, all p 's $> .05$.

amusement condition, there were no differences between conditions on how participants wanted to respond to the situation if provided the choice.

(2) What is the Relationship between Trait Boredom and Individuals' State Boredom Experience and Response Motivations?

Pearson's product moment correlations examined the relationships of trait boredom—as measured by the SBPS—with participants' post-video state boredom experience (intensity, valence, arousal, distress) and response motivations. Tables 4 and 5 presents the correlations among participants in the boredom and amusement conditions, respectively.

Among participants in the boredom condition, the SBPS had small-to-moderate positive associations with post-video boredom intensity and distress, and moderate-to-large negative relationships with valence and arousal. With regards to participants' response motivations after watching the boring video clip, the SBPS had small-to-moderate positive associations with participants' motivation to seek relief (behavioural inhibition/avoidance) and amotivation/avolition, as well as a moderate-to-large positive relationship with participants' uncertainty of what to do. The SBPS had a small-to-moderate inverse association with participants' motivation to do something meaningful after the boring video clip. The SBPS was unrelated to all other response motivations among participants in this condition (Table 4).

Table 4

Correlations of SBPS with State Boredom Experience (Intensity, Valence, Arousal, Distress) and Responses Motivations after Boredom Induction

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1.	-										
2.	.22***	-									
3.	-.39***	-.37***	-								
4.	-.35***	-.39***	.43***	-							
5.	.22***	.19**	-.46***	-.14*	-						
6.	-.14*	-.05	.17**	.10	-.12	-					
7.	-.11	-.12	.25***	.15*	-.14*	.59***	-				
8.	.00	.11	.07	.04	-.01	.45***	.42***	-			
9.	.16*	.01	.01	-.14*	.03	-.16*	.07	.25***	-		
10.	.12	.06	-.12	-.03	.28***	-.03	.10	.08	-.02	-	
11.	.36***	.10	-.28***	-.28***	.07	-.18**	-.09	-.16*	.01	.14*	-
12.	.19**	.12	-.30***	-.28***	.10	-.22***	-.14*	-.14*	-.07	.25***	.54***

Note. 1. SBPS; 2. Boredom intensity; 3. Valence; 4. Arousal; 5. Distress; 6. Seek meaning; 7. Seek creativity; 8. Seek sensation; 9. relief (Beh. inhibition/avoidance); 10. Seek destruction/release frustration (RAM); 11. Uncertainty; 12. Amotivation/Avolition

* $p < .05$. ** $p < .01$. *** $p < .001$.

Among participants in the amusement condition, the SBPS had a small-to-moderate positive relationship with post-video boredom intensity, a moderate-to-large positive association with distress, a moderate-to-large negative association with valence, and a small-to-moderate negative relationship with arousal. Regarding post-video response motivations, the SBPS had moderate-to-large positive relationships with participants' uncertainty of what to do and amotivation/avolition, as well as a small-to-moderate inverse association with the motivation to seek meaningful activity. Among this group of participants, the SBPS had a small-to-moderate negative relationship with the desire to do something creative and a moderate-to-large positive association with the motivation to do something destructive to release frustration. The SBPS was unrelated to all other response motivations among participants in this condition (Table 5).

Table 5

Correlations of SBPS with State Boredom Experience (Intensity, Valence, Arousal, Distress) and Responses Motivations after Amusement Induction

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1.	-										
2.	.26***	-									
3.	-.32***	-.51***	-								
4.	-.28***	-.46***	.43***	-							
5.	.34***	.52***	-.67***	-.33***	-						
6.	-.27***	-.09	.27***	.14	-.23**	-					
7.	-.27***	-.11	.28***	.19**	-.22**	.47***	-				
8.	-.09	-.04	.25**	.21**	-.13	.44***	.50***	-			
9.	-.07	.12	-.12	-.09	.05	.33***	.21**	.37***	-		
10.	.32***	.33***	-.35***	-.13	.43***	-.12	-.02	.03	.16*	-	
11.	.46***	.26***	-.34***	-.25**	.27***	-.16*	-.15*	-.12	-.07	.44***	-
12.	.30***	.25***	-.34***	-.29***	.42***	-.20**	-.26***	-.25**	-.02	.34***	.48***

Note. 1. SBPS; 2. Boredom intensity; 3. Valence; 4. Arousal; 5. Distress; 6. Seek meaning; 7. Seek creativity; 8. Seek sensation; 9. relief (Beh. inhibition/avoidance); 10. Seek destruction/release frustration (RAM); 11. Uncertainty; 12. Amotivation/Avolition

* $p < .05$. ** $p < .01$. *** $p < .001$.

As a result, these findings suggests that, regardless of the experimental condition, participants with greater trait boredom—as measured by the SBPS—felt more bored, negative, distressed, and less energized after watching their assigned video clip. Moreover, to the degree that an individual was boredom prone, he/she was uncertain of what to do after the experimental manipulation and struggled with amotivation/avolition, and was also less motivated to do something meaningful. Among those participants made to feel bored, trait boredom was additionally related to the motivation to seek relief (behaviourally inhibit). However, among those participants made to feel amused, trait boredom was additionally associated with the motivation to release frustration (via destructive behaviour), as well as lower motivation to do something creative. Based on just the direction and magnitude of the correlations, these findings appear to suggest that trait boredom is linked with response motivations that are likely maladaptive (i.e., uncertainty, amotivation, desire to do something destructive to release frustration) than adaptive (i.e., seeking meaning, seeking creativity, etc.).

(3) Does Trait Boredom Interact with the Situation in its Predictions of Participants' State Boredom Experience or Response Motivations?

A series of multiple regressions were conducted in order to examine whether trait boredom and/or the situation (i.e., boring versus amusing) predicted one's state boredom intensity, valence, arousal, distress, and response motivations after the video clip and if so, whether their effect is independent or interactive. These analyses would allow me to explore if trait boredom moderates the impact of an individual's current situation on his/her state boredom experience or response motivations. Specifically, four separate simultaneous multiple regression models were estimated, in which post-video boredom intensity, valence, arousal, and distress scores were regressed on the SBPS, condition variable, and a cross-product variable representing the

interaction between the condition and SBPS (e.g., post-video boredom intensity was regressed on condition, SBPS, and a ‘condition by SBPS’ interaction term). Seven separate simultaneous multiple regression models were estimated, in which post-video response motivation scores were regressed on the SBPS, condition variable, and a cross-product variable representing the interaction between the condition and SBPS (e.g., post-video ‘seeking meaning’ was regressed on condition, SBPS, and a ‘condition by SBPS’ interaction term). For all models, if an interaction was not significant, then the model was re-run without the interaction term in order to obtain a better estimate of the main effects of individual predictors; these results are presented on Table 6. Appendix C presents the original models that found non-significant interaction terms.

Trait boredom and state boredom experience after a boring or non-boring situation.

The interaction between condition and SBPS was not significant in predicting post-video boredom intensity ($p = .976$), valence ($p = .515$), arousal ($p = .513$) and distress ($p = .284$). The interaction accounted for less than 1 percent of the variance in these state boredom outcomes (see the semi-partial correlations presented in Appendix C) and thus, it was subsequently removed from its respective model. In the re-run models, condition uniquely predicted post-video boredom, valence, arousal, and distress, above and beyond SBPS, such that participants in the boredom condition felt more bored, less positive, less energized, and more distressed than those in the amusement condition (all p 's $< .01$; Table 6). The SBPS was also a significant unique predictor, such that participants with higher SBPS scores felt more bored, less positive, less energized, and more distressed after the manipulation (all p 's $< .001$; Table 6). Semi-partial correlations indicated that condition was the stronger unique predictor of boredom intensity, valence, and arousal (accounting for 10 to 12% of the variance in these outcomes), whereas SBPS was the stronger unique predictor of distress (accounting for 7% of the variance).

Trait boredom and response motivations after a boring or non-boring situation.

The interaction between condition and SBPS was not significant in predicting participants' post-video motivation to seek meaning ($p = .275$), motivation to seek creativity ($p = .134$), motivation to seek sensation ($p = .384$), uncertainty / not knowing what to do ($p = .254$), and amotivation/avolition ($p = .254$). The interaction accounted for less than 1 percent of the variance in these response motivations (see the semi-partial correlations presented in Appendix C) and thus, it was subsequently removed from its respective model. In the re-run models, condition showed no significant main effect on participants' motivations to seek meaning, seek creativity, seek sensation, as well as participants' uncertainty and amotivation/avolition (Table 6). The SBPS, on the other hand, was a significant unique predictor of certain post-video response motivations, above and beyond condition, such that participants with higher SBPS scores endorsed lower motivation to do something meaningful, lower motivation to do something creative, more uncertainty about what to do, and more amotivation/avolition (all p 's $< .001$; Table 6). Semi-partial correlations indicated that SBPS was a stronger unique predictor of these four response motivations than condition (accounting for 3 to 16% of the variance in these outcomes). The SBPS was not uniquely predictive of the motivation to seek sensation.

In contrast to the non-significant interactions noted above, the interaction between condition and SBPS was significant in the prediction of post-video motivations to seek relief (behaviourally inhibit; $p = .018$), and to do something destructive to release one's frustration ($p = .031$). This suggests that SBPS moderates the relationship between condition and these two response motivations after the experimental manipulation. The interaction accounted for precisely 1.30% and 1.04% of the variance in the motivation to seek relief and the motivation to do something destructive to release frustration, respectively, and was probed further in each

model. Specifically, condition was re-coded and the model for participants' motivation to seek relief was re-estimated in order to examine the simple slope of SBPS for participants in the amusement condition (i.e., original model: amusement group = 0, boredom group = 1) and boredom condition (i.e., re-estimated model: boredom group = 0, amusement group = 1). The simple slope for SBPS in the original model was not significant ($B = -.01, t = -.93, p = .355$), suggesting that the SBPS is not predictive of one's motivation to seek relief and behaviourally inhibit after an amusing task. The simple slope for SBPS in the re-estimated model was significant ($B = .02, t = 2.60, p = .010$), indicating that a higher SBPS score among participants who undergo a boring task predicts more motivation to seek relief and behaviourally withdraw after the task. The model for participants' motivation to release frustration was also re-estimated in order to examine the simple slope of SBPS for participants in the amusement condition (i.e., original model: amusement group = 0, boredom group = 1) and boredom condition (i.e., re-estimated model: boredom group = 0, amusement group = 1). The simple slope for SBPS in the original model was significant ($B = .06, t = 4.41, p < .001$), indicating that the SBPS is a significant predictor of greater motivation to do something destructive to release one's frustration after an amusing situation. The simple slope for SBPS in the re-estimated model was not significant ($B = .02, t = 1.88, p = .061$), suggesting that the SBPS is not a significant predictor of one's motivation to do something destructive to release frustration after a boring situation.

Overall, these findings indicate that, while both the situation and the SBPS predicted participants' state boredom experience (boredom intensity, valence, arousal, and distress), only the SBPS predicted participants' response motivations. The SBPS predicted the motivation to seek relief (behaviourally inhibit) after one undergoes a boring task, and the motivation to do something destructive to release frustration after one undergoes a non-boring task.

Table 6

Multiple Regressions Predicting Post-Video Scores in State Boredom Experience (Intensity, Valence, Arousal, Distress) and Response Motivations after a Boredom Manipulation

Outcome: Post-Video	R^2	Predictor	B	sr^2	t	p
Boredom (Intensity)	0.18	Condition	1.33	0.12	8.05	< .001
	$F(2, 432) = 46.89, p < .001$	SBPS	0.04	0.05	5.07	< .001
Valence	0.25	Condition	-1.01	0.12	-8.45	< .001
	$F(2, 432) = 70.99, p < .001$	SBPS	-0.05	0.11	-8.06	< .001
Arousal	0.20	Condition	-0.94	0.10	-7.22	< .001
	$F(2, 432) = 53.15, p < .001$	SBPS	-0.05	0.09	-7.07	< .001
Distress	0.10	Condition	0.47	0.02	3.35	.001
	$F(2, 432) = 23.35, p < .001$	SBPS	0.04	0.07	5.82	< .001
Seek meaning	0.04	Condition	-0.08	0.00	-0.61	.544
	$F(2, 432) = 8.34, p < .001$	SBPS	-0.03	0.04	-4.01	< .001
Seek creativity	0.04	Condition	-0.24	0.01	-1.55	.121
	$F(2, 432) = 8.11, p < .001$	SBPS	-0.03	0.03	-3.65	< .001
Seek sensation	0.01	Condition	-0.20	0.00	-1.44	.152
	$F(2, 432) = 1.30, p = .273$	SBPS	-0.01	0.00	-0.68	.497
Seek relief (Beh. inhibition/avoidance)	0.02	Condition	-0.94	0.01	-2.19	.029
	$F(3, 431) = 2.56, p = .054$	SBPS	-0.01	0.00	-0.93	.355
		Condition X SBPS	0.03	0.01	2.38	.018

Seek destruction/release frustration (RAM)	0.05 $F(3, 431) = 7.77, p < .001$	Condition	1.20	0.01	2.18	.029
		SBPS	0.06	0.04	4.41	< .001
		Condition X SBPS	-0.04	0.01	-2.17	.031
Uncertainty	0.16 $F(2, 432) = 42.13, p < .001$	Condition	0.15	0.00	0.86	.393
		SBPS	0.08	0.16	9.10	< .001
Amotivation	0.06 $F(2, 432) = 12.95, p < .001$	Condition	0.13	0.00	0.70	.487
		SBPS	0.05	0.05	5.01	< .001

Note: Condition variable was scored as amusement group = 0, boredom group = 1.

General Discussion

Summary of Study and Findings

The SBPS was constructed in response to the methodological shortcomings of the BPS (i.e., reversed-scored items that artificially yielded two factors), and, based on the original conceptualization of the BPS, the authors of the scale purported that the SBPS measures the tendency for an individual to want, but fail, to engage in sufficiently satisfying activity (Struk et al., 2015). The current study tested another potential understanding of the SBPS that is linked to the conceptualization of state boredom as a functional state, as well as to what the literature suggests trait boredom scales measure (and do not measure). That is, if state boredom is proposed to be a self-regulatory signal that pushes an individual to engage in cognitively engaging activity (Danckert et al., 2018), and if trait boredom measures (i.e., the BPS and ZBS) do not moderate the impact of the situation that an individual is in on his/her boredom intensity, then it is possible that the SBPS may moderate the impact of the situation on the individual's motivations to respond to the situation/induced state. In this study, participants rated their boredom intensity, valence, arousal, distress, and response motivations before and after they were randomly assigned to watch a boring or amusing clip. Boredom intensity, valence, arousal, and distress represented participants' state boredom experience (i.e., how the participant felt), whereas seven response motivations represented how the situation/feeling of boredom motivated participants. The results of the current study converge to further inform what the SBPS potentially measures.

The paired-sample and independent samples *t*-tests suggest that being in a boring situation made individuals feel more bored and more negative—*both* over time (small-to-moderate effects of the boring video clip) and more so than individuals in an amusing situation (moderate-to-large

effects of the experimental manipulation). Although there were no significant changes within the boredom condition, participants in this condition felt more distressed and less energized after the video than participants in the amusement condition. However, the situation that an individual was in did not impact his/her response motivations. This pattern was corroborated by the multiple regression analyses, which found a unique main effect of condition on boredom intensity, valence, arousal, and distress, but no unique main effect of condition on individuals' response motivations when statistically controlling for SBPS scores. Moreover, consistent with prior research (Mercer-Lynn et al., 2014), the SBPS did not interact with condition to predict state boredom experience (i.e., post-video boredom intensity, valence, arousal, and distress).

In contrast, when statistically controlling for condition, the SBPS uniquely predicted individuals' state boredom experience *and* response motivations: Regardless of the context, more boredom prone individuals feel more bored, more negative, less energized, more distressed, *and* are less motivated to do meaningful and creative activities, are more uncertain about what to do, and struggle with amotivation/avolition. Furthermore, the SBPS *did* interact with condition in the prediction of certain post-video response motivations: Trait boredom positively predicted the motivation to seek relief (behaviourally inhibit) among participants the boredom condition and trait boredom positively predicted the motivation to do something destructive to release frustration among participants in the amusement condition.

Causes of State Boredom Experience versus Response Motivations

The findings of the current study underscore two non-mutually exclusive conceptions of state boredom: situation-based state boredom and person-based state boredom (Mercer-Lynn et al., 2014). These concepts are not new in boredom theory. Situation-based state boredom has been referred to as *situation-dependent boredom* (Todman, 2003) and *reactive boredom* (Neu,

1998), and it emphasizes the central role for environmental conditions in the experience of boredom, such that state boredom is the response to external stimulus conditions that are understimulating and/or repetitive. Person-based boredom, on the other hand, has been referred to as *situation-independent boredom* (Todman, 2003) and *endogenous boredom* (Neu, 1998), and it emphasizes boredom that is neither triggered nor maintained by specific environmental conditions, but rather comes from within. Earlier literature (O’Conner, 1967) posits that there may be two kinds of boredom in terms of its duration and cause: The first kind is brief and transitory and the second kind is more severe and chronic, suggesting that the former occurs in response to the situation and the latter is caused by factors within the person. Taken together, these theorists have described the possibility of two kinds of boredom based on the cause⁹.

The results of the current study suggest that when it pertains to the experience of state boredom—the intensity, valence, arousal, and distress that an individual experiences—both the situation (i.e., a boring situation) and the person (i.e., trait boredom, as measured by the SBPS) are predictors and their effects are independent of each other. In other words, regardless of an individual’s level of trait boredom, being in boring situation predicts that an individual will feel more bored, more negative, more distressed, and less energized than being in an amusing situation. Regardless of the situation that an individual is in (boring or amusing), being high on trait boredom predicts that an individual will feel more bored, more negative, more distressed,

⁹ Different causes of boredom do not result in different experiences of boredom. Rather, it is plausible that state boredom, whether a result of the situation or the person, is experienced the same way (e.g., as a feeling of emptiness, time dragging, restlessness, etc.; Mercer-Lynn et al., 2014). For example, a study by Fahlman and colleagues (2009) found that lower life meaning (a key aspect of person-based boredom) increased individuals’ state boredom, as indexed by higher scores on a state boredom scale; and higher scores on this state boredom scale have also been observed among individuals who undergo the same boredom induction used in the current study (Hunter et al., 2015).

and less energized. When it comes to the experience of state boredom, the cause is both situation-based and person-based.

Yet, individuals' motivations to respond to the situation/induced state appear to be solely determined by person-based factors (i.e., trait boredom, as measured by the SBPS). Regardless of the situation, the SBPS positively predicts an individual's uncertainty of what to do and amotivation/avolition to do anything after the situation. Both of these response motivations are likely to be ineffectual. If an individual is uncertain of what alternative courses of actions will allow them to optimally use their cognitive resources, then the feeling of boredom (if experienced) will persist. If an individual lacks the motivation/volition to pursue alternative courses of actions to optimally use their cognitive resources, then feeling of boredom (if experienced) will persist; amotivation/avolition, in particular, is linked to negative functional (i.e., academic, occupational, psychosocial) outcomes (e.g., American Psychiatric Association, 2013). Additionally, regardless of the situation that an individual is in, the SBPS *negatively* predicts that an individual will be motivated to do something meaningful or creative. Partaking in meaningful or creative activities are likely to be *effective* in reducing state boredom (Danckert et al., 2018; Elpidorou, 2014; Elpidorou, 2018a; Elpidorou 2018b) and are linked to *positive* functional outcomes (Atwood & Pretz, 2016; Czekierda, Banik, Park, & Luszczynska, 2017; Dezutter, Luyckx, & Wachholtz, 2014; Forgeard & Jaufman, 2016; Furnham, 2016; Geher, Betancourt, & Jewell, 2017; Krok, 2015; Oriol, Amutio, Mendoza, Da Costa, & Miranda, 2016; Yalçın & Malkoç, 2015). Taken together, this pattern of results suggests the SBPS likely taps into ineffectual and maladaptive response motivations—irrespective of the situation that a person is in. An iteration of the current study that also explores the impact of individuals' response motivations or response tendencies on subsequent state boredom (i.e., intensity, valence, arousal,

distress) could test the potential characterization of trait boredom as responding poorly *even in* non-boring situations such that one then becomes bored.

Trait Boredom: A Disposition of Uncertain, Amotivated, and Avoidant Behaviours?

The SBPS interacted with the situation in predicting some of individuals' post-video response motivations. The SBPS positively predicted the motivation to do something destructive to release frustration after an amusing situation, and the SBPS positively predicted the motivation to behaviourally inhibit and seek relief after a boring situation. This latter finding is consistent with recent work showing that individuals low in trait boredom exhibit a leftward shift in frontal activity over the course of a boring task, which is indicative of approach motivation (Perone, Weybright, & Anderson, 2019). Avoidance is used to withdraw from aversive stimuli, whereas approach is used to engage a stimulus or bring stimulation. Synthesizing the results of the current study, the unique main effect of the SBPS on the post-video response motivations noted above, as well as the finding that those high in trait boredom sought relief after the boredom induction, points to the idea that trait boredom has a “behavioural signature” in which a person exhibits a consistent pattern of behaviour (Nesselrode & Ram, 2004): The highly boredom prone individual is uncertain of what to do, amotivated/lacks volition to do anything, and lacks the motivation to engage in meaningful or creative activities; and when made to feel bored, specifically, he/she behaviourally inhibits and seeks relief. Indeed, resolving state boredom by restructuring what one is doing into something more interesting or novel or meaningful is a signature of approach (Mannell, 1984), yet the current findings point to an uncertain, amotivated, and avoidant behavioural signature of trait boredom. Future studies that use probes to survey participants' response motivations across several time-points (as opposed to

just two time-points) would further clarify how highly boredom prone individuals tend to (want to) respond.

The finding that the SBPS positively predicted the desire to do something destructive to release frustration among participants in the amusement condition seems counterintuitive to the idea that a boredom prone individual displays an uncertain, amotivated, and avoidant behavioural style. Moreover, in keeping with RAM (McGregor et al., 2010), it is surprising that highly boredom prone individuals experienced a desire to release frustration after the amusing video clip, and not after the boring video clip. Regardless, extreme levels of *both* approach (e.g., risk-taking, impulsivity) and avoidance (e.g., seclusion) behaviours may be unhealthy (Corr, 2013). Thus, this finding further supports the idea that the SBPS taps into the tendency toward maladaptive responding, irrespective of the context that one is in.

Implications of Present Results for the Functional Account of State Boredom

The results of the current study do not appear to fit with the functional account of state boredom. Among participants in the boredom condition, there was a significant increase from pre-video to post-video in the motivation to do something exciting/energizing (seek sensation)—but this pattern was also observed in the amusement condition. Moreover, there were no condition differences in any of the post-video response motivations. Additionally, there were no significant correlations between post-video boredom intensity and post-video response motivations among participants in the boredom condition (see Table 4 for these correlations). Post-video boredom intensity was positively associated with the desire to release frustration (RAM), as well as uncertainty of what to do and amotivation/avolition among participants in the amusement condition (see Table 5 for these correlations). Together, the *t*-tests and correlations appear to disconfirm the proposal that a boring situation / state of boredom motivates individuals

to seek alternative cognitively engaging activity (i.e., seeking something meaningful or creative to do).

This then prompts the question as to why the current findings do not align with previous empirical work that shows that induced boredom prompts individuals to seek optimal use of one's cognitive faculties, for example through seeking meaning (Van Tilburg & Igou, 2011; Van Tilburg & Igou, 2012; Van Tilburg et al., 2013). One reason is that these studies may have conceptually and psychometrically confounded the independent variable and dependent variable, such that similar items are used to measure both variables. Thus, it follows that a relationship or link between the state of boredom and search for meaning will emerge. More importantly, past research has not deconstructed the causal contributions of *both* situation-based (i.e., condition) and the person-based (i.e., trait boredom, as assessed by the SBPS) factors on individuals' response motivations. The current study examined the significance of both factors, with the SBPS uniquely predicting several response motivations, above and beyond the condition participants were assigned to. Accordingly, it may be that it is boredom caused by the person (i.e., trait boredom) that is linked to response motivations, and that boredom caused by the situation (i.e., the condition) is not linked to response motivations. Even so, the results of the current study appear to link person-based boredom to rather ineffectual and maladaptive response motivations (e.g., uncertainty, amotivation/avolition, etc.), as opposed to response motivations that would likely satisfy one's desire for cognitive engagement (e.g., seeking meaning or creativity).

Boredom: A Dynamic Experience that may be Moderated by Personality

The proposal that state boredom is a self-regulatory signal that pushes an individual to seek optimal use of his/her cognitive resources implies that boredom is not a stable state, but rather a

dynamic one. Indeed, Mills and Christoff (2018) posit the importance of understanding the instability of boredom and its ensuing temporal dynamics, such as fluctuations in arousal (Mills & Christoff, 2018). In other words, within a given time frame, the feeling of boredom evolves and as that happens, individuals respond to the most salient signal of boredom. Responses to boredom or response motivations, then, can also be thought of as temporal and dynamic.

Participants' state boredom experience and response motivations were assessed twice in the current study (immediately before and immediately after the experimental manipulation), but may very well change over the course of boredom-inducing activity and well after the activity has ended. Future research, perhaps through ecologically valid experience sampling methods, will want to survey the experience of state boredom and individuals' response motivations at multiple time-points and within multiple contexts, in order to better understand how these outcomes change over time and if these changes are moderated by one's personality. The results of the current study suggest that personality—specifically, trait boredom—not only predicts state boredom experience (intensity, valence, arousal, distress), but also certain response motivations. The SBPS predicted certain response motivations after particular contexts (captured by the significant 'Condition X SBPS' interaction) and it also predicted certain response motivations across all contexts (captured by the significant main effect of SBPS). It may be the case that other personality traits may interact with the situation in predicting similar or different response motivations than what was predicted with the SBPS. Both empirical and theoretical work posit several cognitive (e.g., symptoms of ADHD, attention-related errors, absorption), affective (e.g., experiential avoidance, alexithymia, impoverished life meaning), motivational (e.g., BIS/BAS motivation, intrinsic/extrinsic motivation, amotivation), and volitional (e.g., self-control, impulsivity, assessment regulatory mode, failure-related preoccupation and decision-related

hesitation) causes and correlates of trait boredom (Blunt & Pychyl, 1998; Eastwood et al., 2012; Mercer-Lynn et al., 2011; Mercer-Lynn et al., 2013; Mugon, Struk, & Danckert, 2018; Struk, Scholer, & Danckert, 2015). However, these studies have used either the BPS or ZBS to measure trait boredom. An avenue for future research is to test if purported causes and correlates of trait boredom predict individuals' state boredom experience and response motivations, above and beyond the SBPS. Doing so would further inform what the SBPS measures, and more broadly, examine the utility of the concept of trait boredom (i.e., if trait boredom is redundant with other personality constructs; Mercer-Lynn et al., 2013).

Limitations and Additional Future Directions

One limitation of the present research is that one item each was used to measure boredom intensity, valence, arousal, distress, and the seven response motivations. Although fewer items are less intrusive when probing for a respondent's inner experiences, the ability to test the validity (i.e., construct, face, etc.) and reliability (i.e., internal reliability) of these items is limited. Moreover, while all items were constructed and revised to best capture a given response motivation, there are undoubtedly nuances in how, for example, individuals may seek meaning or seek relief/comfort (i.e., engage in avoidance behaviours) or seek to release one's frustration (i.e., engage in reactive approach behaviours). One item does not capture the nuances of each response motivation, which could account for why there were no within-condition changes and between-condition differences in these outcomes. Accordingly, future research should consider adding more items for each response motivation.

Finally, overlooked in the current study is how individuals cope with and *internally* regulate their feelings of boredom (versus other negative feelings). Depending on the situation, there will be different strategies for dealing with boredom (Cummings, Gao, & Thornburg, 2016;

Daniels, Tze, & Goetz, 2015; Game, 2007). While the most obvious strategy is to seek escape from boredom by quitting or disengaging with the activity that is perceived to be the cause of boredom, it is not always possible for an individual to adopt such a strategy. If behavioural escape is not possible, but the individual lacks a sufficient reason to perform the boring activity well (or if the boring activity is easy), one may adopt a cognitive-avoidance strategy by engaging in daydreaming or mind-wandering in order to feel less negative (Fisher, 1993; Harris, 2000; Holahan, Moos, & Schaefer, 1996). However, one may also change the manner in which he or she engages with the activity and the feeling. This could involve a cognitive reappraisal of the situation that gives rise to the feeling or of the feeling itself (Holahan et al., 1996). For example, one could try to find meaning or value in the boring activity by seeing it in a new light (Nett, Goetz, & Daniels, 2010; Tze et al., 2013). Finally, rather than listening to the signal of state boredom, that one's cognitive resources are not engaged, one may adopt a thought suppression strategy by simply ignoring the signal. A follow-up study that examines if the SBPS interacts with the situation in predicting how respondents (prefer to) internally regulate their boredom would provide the opportunity to further inform what the scale measures.

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Appendix A: SBPS Items

1. I often find myself at “loose ends,” not knowing what to do.
2. I find it hard to entertain myself.
3. Many things I have to do are repetitive and monotonous.
4. It takes more stimulation to get me going than most people.
5. I don’t feel motivated by most things that I do.
6. In most situations, it is hard for me to find something to do or see to keep me interested.
7. Much of the time, I just sit around doing nothing.
8. Unless I am doing something exciting, even dangerous, I feel half-dead and dull.

Rated from 1 (*strongly disagree*) to 7 (*strongly agree*)

Appendix B: Emotion Probe Items

Feeling Intensity:

1. *Right now, I am feeling: **HAPPY***
 2. *Right now, I am feeling: **BORED***
 3. *Right now, I am feeling: **SAD***
 4. *Right now, I am feeling: **FRUSTRATED***
 5. *Right now, I am feeling: **INDIFFERENT***
 6. *Right now, I am feeling: **DISGUSTED***
 7. *Right now, I am feeling: **INTERESTED***
- Rated from 1 (not at all) to 7 (very intensely)

Valence:

1. <i>I am feeling:</i>						
1 – Negative	2	3	4 – Neither Positive Nor Negative	5	6	7 – Positive

Arousal:

2. <i>I am feeling:</i>						
1 – Very little Energy	2	3	4 – Moderate amount of Energy	5	6	7 – A lot of Energy

Distress / Discomfort:

3. <i>I am feeling:</i>						
1 – Very little Distress / Discomfort	2	3	4 – Moderate amount of Distress / Discomfort	5	6	7 – A lot of Distress / Discomfort

Response Motivation:

Right now, if I could do anything I wanted, I would...

1. *Do something valuable that would be meaningful to me. (seek meaning)*
2. *Do something that would allow me to explore my ideas / abilities. (seek creativity)*
3. *Do something exciting that would energize me. (seek sensation)*
4. *Do something comfortable that would bring me relief. (seek relief; behavioural inhibition/avoidance)*
5. *Do something destructive that would allow me to release my frustration. (release frustration; reactive behavioural activation/approach)*
6. *Not know what to do. (uncertainty)*
7. *Not care to do anything at all. (amotivation)*

Rating scale: 1 (strongly disagree) – 4 (neither agree nor disagree) – 7 (strongly agree)

Appendix C: Original Multiple Regression Models for Research Question #3

Original Multiple Regression Models: Predicting Post-Video Scores in State Boredom Experience (Intensity, Valence, Arousal, Distress) and Response Motivations after a Boredom Manipulation

Outcome: Post-Video	R^2	Predictor	B	sr^2	t	p
Boredom (Intensity)	0.18 $F(3, 431) = 31.19, p < .001$	Condition	1.35	0.01	2.62	.009
		SBPS	0.04	0.02	3.28	.001
		Condition X SBPS	-0.00	0.00	-0.03	.976
Valence	0.25 $F(3, 431) = 47.40, p < .001$	Condition	-0.78	0.01	-2.10	.036
		SBPS	-0.04	0.04	-4.69	< .001
		Condition X SBPS	-0.01	0.00	-0.65	.515
Arousal	0.20 $F(3, 431) = 35.53, p < .001$	Condition	-0.69	0.01	-1.70	.089
		SBPS	-0.04	0.03	-4.04	< .001
		Condition X SBPS	-0.01	0.00	-0.65	.513
Distress	0.10 $F(3, 431) = 15.96, p < .001$	Condition	0.92	0.01	2.09	.037
		SBPS	0.05	0.04	4.56	< .001
		Condition X SBPS	-0.02	0.00	-1.07	.284
Seek meaning	0.04 $F(3, 431) = 5.96, p = .001$	Condition	-0.50	0.00	-1.23	.219
		SBPS	-0.04	0.03	-3.42	.001
		Condition X SBPS	0.02	0.00	1.09	.275
Seek creativity	0.04 $F(3, 431) = 6.17, p < .001$	Condition	-0.94	0.01	-1.92	.055
		SBPS	-0.04	0.03	-3.50	.001
		Condition X SBPS	0.02	0.01	1.50	.134
Seek sensation	0.01 $F(3, 431) = 1.21, p = .340$	Condition	-0.57	0.00	-1.29	.199
		SBPS	-0.01	0.00	-1.10	.270
		Condition X SBPS	0.01	0.00	0.87	.384

Uncertainty	0.17 $F(3, 431) = 28.54, p < .001$	Condition	0.72	0.00	1.36	.176
		SBPS	0.09	0.09	6.73	< .001
		Condition X SBPS	-0.02	0.00	-1.14	.254
Amotivation	0.06 $F(3, 431) = 9.07, p < .001$	Condition	0.73	0.00	1.31	.193
		SBPS	0.06	0.04	4.10	< .001
		Condition X SBPS	-0.02	0.01	-1.14	.254

Note: Condition variable was scored as amusement group = 0, boredom group = 1.